



Fire and carbon-oriented management across Pacific Northwest forests

Research focus

This research is intended to improve our understanding of fuels and carbon management in the forests of western Oregon and Washington and northwestern California, and how it can change landscape-level outcomes over varied and multi-owner forested landscapes. Ideally, the research will improve understanding of: (1) How different types of landowners and managers in Pacific Northwest forests perceive wildfire risk, and how and why they choose to manage (or not) this risk; (2) How landowners and managers think about carbon in their management decisions, and how and why they choose to manage (or not) to improve carbon sequestration and storage; and (3) The effectiveness and feasibility of various silvicultural treatments for enhancing resistance to wildfire and increasing the climate benefits that forests can deliver, such as sequestration of carbon in forests and storage in forest products.

Project objectives

- Identify the motivations and considerations that guide landowner and manager choices, including trade-offs between managing for different goals;
- Understand how Pacific Northwest forest landowners and managers address fire and climate change concerns through forest management;
- Document the extent to which landscape-scale wildfire risk and fuels management is communicated and coordinated among different landowners;
- Identify opportunities, policies, and programs to improve fuels and carbon management efforts;
- Understand the social and economic feasibility of different fuels treatment activities, and carbon management options, across a range of west-side landscapes and land ownerships;
- Assess and compare modeled short- and long-term (40 yr) outcomes under different management scenarios with respect to wildfire hazard, carbon stored in the forest and forest products, wood production, and economic returns relative to management costs.

Desired Outcomes

- Document the nature of fuels and carbon management activities currently occurring in west-side forests by landowner type
- Demonstrate the effectiveness and longevity of silvicultural prescriptions that reduce fuels and/or produce climate benefits;
- Describe tradeoffs between fuels reduction and other goals;
- Identify policies that decrease barriers to reducing fire hazard and promoting management that delivers climate benefits, where appropriate;
- Identify when cross-ownership boundary fuels management may enhance risk mitigation;
- Provide a basis for prioritizing fuels treatment funding;
- Identify which treatments are best suited to a suite of biophysical and social conditions;
- Identify locations for developing new capacity to utilize non-merchantable wood

Research approach:

The research has two components: 1) gather primary data on past, current and intended future fuels and carbon management activity by forest landowners and managers, and the underlying goals and context that motivate these efforts; and 2) model fuel treatment effectiveness and economic feasibility using the primary data. Greenhouse gas implications of current and potential forest treatments identified and developed under this study will be considered both as part of this study and by scientists working on the PNW Research Station's Carbon Initiative. Research will take place in landscapes that represent a cross-section of fire regimes and ecoregions in western Oregon and Washington, and northwestern California, for intra-regional comparison. Information from private family forest owners will be gathered via landowner surveys. Information from public, Tribal, and private corporate forest owners will be gathered using an interview-based protocol and potentially focus groups.

Fuel treatment prescriptions and simulation of stand and landscape outcomes will be modeled using the BioSum framework (<http://biosum.info>). BioSum connects Forest Inventory and Analysis data on forest conditions with the Forest Vegetation Simulator to depict the impact of management actions on fire resistance and other stand characteristics, simultaneously estimating treatment costs and wood production co-benefits. The simulations in this component will explore outcomes from currently applied landowner management activities—that may or may not promote fire resistance—and contrast those with alternative management actions focused on enhancing fire resistance, including under the potentially more severe fire weather expected with climate change.

Our research would be enhanced through collaboration with partners on . . .

- Reviewing study plans,
- Identifying study focus areas and potential contacts,
- Participating in research design,
- Suggesting or evaluating proposed fuel management prescriptions,
- Sharing relevant treatment effectiveness parameters,
- Reviewing survey instruments and focus group material,
- Advising on desired outcomes, products, and publications useful to managers.

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